



## COURSE SYLLABUS

**Course:** Fire Inspector 1B: Foundations of Fire and Life Safety CFSTES  
**Hours:** 24:00 (21:00 = instruction / 3:00 = testing)  
**Designed For:** The entry-level fire inspector  
**Description:** Upon completion of this course the student will have an introductory knowledge of fire department access and water supply, building system components, occupancy classifications and occupant loads, means of egress, and incidental storage, handling and use of hazardous materials, flammable and combustible liquids, and gases.  
**Prerequisites:** Fire Inspector 1A: Fire Inspector Fundamentals  
**Passing Criteria:** 80%  
**Certification:** Fire Inspector I  
**Class Size:** 30  
**Restrictions:** None

REQUIRED STUDENT MATERIALS	EDITION	PUBLISHER
▪ California Fire Code	current	International Code Council (ICC)
▪ <i>Fire Inspection and Code Enforcement</i>	7th	IFSTA
REQUIRED INSTRUCTOR MATERIALS	EDITION	PUBLISHER
▪ California Building Code	current	International Code Council (ICC)
▪ California Fire Code	current	International Code Council (ICC)
▪ CCR Title 19	current	Online: <a href="http://www.oal.ca.gov/publications.htm">www.oal.ca.gov/publications.htm</a> Print: Barclays ( <a href="http://www.west.thompson.com">www.west.thompson.com</a> )
▪ <i>Inspection and Code Enforcement Instructor Resource Kit</i>	7th	IFSTA

### FIRE INSPECTOR 1B: FOUNDATIONS OF FIRE AND LIFE SAFETY COURSE SYLLABUS

Course Objectives: to provide the student with:

- An introduction to fire department access and water supply
- An introduction to building system components
- An introduction to occupancy classifications and occupant loads
- An introduction to means of egress
- An introduction to incidental storage, handling, and use of hazardous materials, flammable and combustible liquids, and gases

Course Content..... 24:00

#### Unit 1: Introduction

Topic 1: Orientation and Administration ..... 0:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to

Enabling Learning Objectives (ELO):

- Identify the requirements of the facility that is hosting the program
- Will complete all required paperwork for State Fire Training and the organization that is hosting the class.

Discussion Questions

- To be determined by instructor

Activities

- Complete State Fire Paperwork and Organizational paper work

Evaluation: Formative Test, Summative Test

**Unit 2: Fire Department Access and Water Supply (CTS 3-11 and 3-14)**

Topic 1: Fire Department Access..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify the requirements and specifications for fire department emergency access.

Enabling Learning Objectives (ELO):

1. Identify the requirements for fire department access (refer to local requirements), including:
  - Standard
    - Must provide access to within 150 feet of all portions of the exterior of the building
    - Must provide access of more than 150 feet with an approved turnaround
  - Exceptions
    - Discretion of the fire code official
2. Identify the specifications for a required fire department access roadway, including:
  - Width: a minimum of 20 feet clear width
  - Turn radii must conform with local apparatus
  - Fire apparatus turnaround
  - Height minimum: 13 feet 6 inches
  - Weight must conform with local apparatus axle loads
  - Must have all-weather driving surface
  - Local approval required for road slope (see CFC Appendix D)
  - Bridges must support fire apparatus
  - Signage and curb marking must comply with the California Vehicle Code
  - Gates and barricades
    - Key boxes or electronic switches

Discussion Questions

1. Why do local jurisdictions require fire lanes?
2. Who enforces fire lanes?
3. What constitutes an all-weather driving surface?

Activities

1. To be determined by instructor.

Evaluation: Formative Test, Summative Test

Topic 2: Available Firefighting Water Supply ..... 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify issues that impact water flow testing, different hydrant types, and the tools needed to evaluate available water flow, and describe approved water sources, water distribution systems, how hydrant spacing impacts firefighting operations, how dead end water lines impact available fire flow, and how to calculate and graph fire flow results.

Enabling Learning Objectives (ELO):

1. Identify issues that impact water flow testing, including:
  - Discharge requirements (National Pollutant Discharge Elimination System)
  - Flood control authority policies
  - Water purveyor policies
2. Describe approved water sources
3. Describe water distribution systems, including:
  - Private vs. public systems
  - Private vs. public fire hydrants
4. Identify different hydrant types
5. Describe how hydrant spacing impacts firefighting operations
6. Describe how dead end water lines impact available fire flow

7. Identify the tools needed to evaluate available water flow, including:

- Pitot gauge
- Pressure gauge
- Water map showing mains and direction of flow
- Diffusers
- Formulas

8. Describe how to calculate and graph fire flow results

Discussion Questions

1. How do you determine the fire flow for a building or project?
2. How does the installation of fire sprinklers affect fire flow?
3. What sprinkler systems qualify for fire flow reductions?
4. What are the minimum fire flow requirements for commercial and residential projects?
5. How do you determine hydrant spacing?
6. Is a recycled water system an approved water source for firefighting?

Activities

(Instructor to develop)

1. Given a data set, calculate and graph fire flow results.

Evaluation: Formative Test, Summative Test

Topic 3: Access and Water Supply Inspection ..... 0:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to properly inspect, verify proper maintenance of, and verify deficiencies of a location for, fire department access and water supply.

Enabling Learning Objectives (ELO):

1. Describe how to verify that a fire department access road was required as part of construction, including:
  - Ensuring proper and adequate addressing for the property
  - Ensuring all access keys (if provided) are correct and in the key box
  - Verifying proper fire lane maintenance
  - Verifying proper fire department access maintenance
  - Verifying provision of proper fire lane signage and markings
2. Describe how to verify proper maintenance of required water supplies, including:
  - Verifying access to hydrants maintenance
  - Verifying proper maintenance of private hydrants in accordance with CCR, Title 19, chapter 5
3. Describe how to verify deficiencies, including:
  - Observation and documentation
  - Reporting in accordance with jurisdictional codes, standards, and policies
  - Referring to appropriate level when necessary

Discussion Questions

1. What code requires access and water supply for firefighting?
2. What does the code require as the minimum clear height for a fire lane?
3. What does the code state as the minimum width of a fire lane?
4. Who designates fire lanes?

Activities

1. To be determined by instructor

Evaluation: Formative Test, Summative Test

### **Unit 3: Building System Components (CTS: 3-4)**

Topic 1: Construction Features ..... 3:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe the basic

features of construction components.

Enabling Learning Objectives (ELO):

1. Describe the basic features of the following construction components, including:

- Foundations
- Exterior walls
- Floor and ceiling assemblies
- Roof covering and assembly classifications
- Fire barriers
- Fire partitions
- Fire walls
- Fire-resistant joint systems
- Enclosed stairs
- Horizontal assemblies (exit corridors, horizontal exits, rated, unrated)
- Opening protection
- Penetration protection
- Shaft enclosures
- Smoke barriers
- Smoke partitions
- Draft stops
- Attic stops
- Interior finishes
- Fire sprinkler systems (impacts other features)

Discussion Questions

1. What is the purpose of a draft stop?
2. What are the components of a fire-resistance-rated wall?
3. What is the purpose of a parapet?

Activities

1. To be determined by instructor.

Evaluation: Formative Test, Summative Test

Topic 2: Construction Types..... 1:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify types of construction and confirm that construction methods comply with code requirements.

Enabling Learning Objectives (ELO):

1. Identify construction types (methods and materials), including:

- Type I (A and B) – CBC, chapter 6, table 601; IFSTA, p. 124 (7<sup>th</sup> ed.), table 4.1
- Type II (A and B) – CBC, chapter 6, section 602.2 and table 601; IFSTA, p. 124 (7<sup>th</sup> ed.), table 4.1
- Type III (A and B) – CBC, chapter 6, section 602.3; IFSTA, p. 124 (7<sup>th</sup> ed.), table 4.1
- Type IV – Heavy Timber - CBC, chapter 6, section 602.4; IFSTA, p. 124 (7<sup>th</sup> ed.), table 4.1
- Type V (A and B) – Wood Frame – CBC, chapter 6, section 602.5; IFSTA, p. 124 (7<sup>th</sup> ed.), table 4.1

2. Describe construction type in additions and remodels and how to confirm that construction methods comply with code requirements

Discussion Questions

1. What are the different types of construction?
2. What type of construction does the code approve for hospitals?

Activities

1. Activity 3-2: Construction Types

Evaluation: Formative Test, Summative Test

**Comment [ALS1]: Action Item**  
Requested answer key from Dennis  
via email on 8/21/10.

**Unit 4: Occupancy Classifications and Occupant Loads (CTS: 3-1 and 3-2)**

**Topic 1: Occupancy Classifications..... 2:00**

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify occupancy-related codes, regulations and standards; the correct occupancy classification for various occupancies and uses; and occupancy-related fire and life safety hazards.

Enabling Learning Objectives (ELO):

1. Identify how a building official determines occupancy classifications
2. Identify the applicable codes, regulations and standards
3. Identify fire or life safety hazards presented by various occupancies
4. Identify occupant load factors for all uses and occupancies
5. Identify operational features that change the occupancy classification
6. Identify state-regulated occupancy classifications
7. Describe how the classifications and uses of a building can be distinct and different within a single building, including:
  - Mixed-use
  - Single-use

Discussion Questions

1. What is the difference between gross and net square footage?
2. Who determines occupant classifications and occupant loads?
3. What occupant load factors are used for assembly uses?
4. What is a mixed-use occupancy?

Activities

1. Fill-in-the-blank occupancy classification identification.

Evaluation: Formative Test, Summative Test

Comment [ALS2]: Action Item  
Ed will get from the current 1A class.

**Topic 2: Calculating Occupant Load ..... 1:30**

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to correctly calculate the occupant load of a building or a portion of a building based on use and square footage.

Enabling Learning Objectives (ELO):

1. Identify the function of the area to be evaluated
2. Identify the correct occupant load factor based on function using Table 1004.1.1 – Maximum Floor Area Allowances Per Occupant (CFC or CBC)
3. Describe how to determine square footage, including:
  - Gross square footage: the inside dimension of the exterior walls of a building
  - Net square footage: the actual occupied area excluding shafts, unoccupied areas, stairways, etc. (See CBC Chapter 10 definitions)
4. Identify the use of and various measuring tools used to calculate occupant load, including:
  - Plans and scales
  - Field measuring devices
  - Ceiling tiles
  - Floor tiles

Discussion Questions

1. What are the purposes and uses of a building's occupant load?
2. When does the code require the posting of an occupant load?

Activities

(Instructor to develop)

1. Given several scenarios, determine the occupancy and occupant load.

Evaluation: Formative Test, Summative Test

**Unit 5: Basic Means of Egress (CTS: 3-3)****Topic 1: Means of Egress Elements ..... 1:00**

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to describe exit access, exits and exit discharge.

Enabling Learning Objectives (ELO):

1. Describe exit access, including:
  - Corridors
  - Aisles
  - Pathways leading to an exit
  - Unenclosed ramps
  - Occupied rooms
2. Describe exits, including:
  - Number required
  - Doors
  - Exit corridors
  - Exit passageways
  - Protected or exterior stairwells
  - Smoke-proof enclosures and pressurized stairways
3. Describe exit discharge, including:
  - Exterior walkways
  - Private driveways and alleys

Discussion Questions

1. How does an inspector determine exit width?
2. What does the code cite as the minimum required exit width?
3. How do you determine the aisle width between unfixed tables and chairs?

Activities

1. Activity 5-1: Means of Egress Elements

Evaluation: Formative Test, Summative Test

**Comment [ALS3]: Action Item**  
Requested answer key from Bill via email on 8/21/10.

Topic 2: Means of Egress Components ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to: describe means of egress components, pathway illumination, emergency lighting, exit signs and illumination, special egress control devices, access-controlled egress doors, travel distance; and be able to identify, document and report means of egress deficiencies.

Enabling Learning Objectives (ELO):

1. Describe means of egress components, including:
  - Doors
  - Door swing
  - Hardware
  - Corridors
    - Walls
    - Ceilings
    - Floors
  - Stairs
  - Ramps
  - Fire escape ladders
  - Fire escape slides (slidescapes)
2. Describe egress pathway illumination
3. Describe emergency lighting
4. Describe exits signs and exit sign illumination
5. Describe special egress control devices
6. Describe access controlled egress doors
7. Describe travel distance (fire sprinklers, horizontal exits, active vs. passive)

8. Describe how to identify, document and report deficiencies

Discussion Questions

1. What is the difference between a fire door and a smoke and draft assembly?
2. What mandates the maintenance of fire escapes?
3. When does the code require pathway illumination?
4. When does the code require floor-level exit signs?

Activities

1. To be determined by instructor.

Evaluation: Formative Test, Summative Test

Topic 3: Egress Inspection ..... 1:30

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to determine occupancy-based egress requirements and egress maintenance conditions.

Enabling Learning Objectives (ELO):

1. Describe occupancy-based egress requirements, including:

- Occupant load
- Travel distance
- Number of exits
- Separation

2. Describe egress maintenance conditions, including:

- Operational doors
- Unobstructed pathways
- Proper illumination
- Proper signage
- Under alarm conditions
  - Delayed egress locks
  - Access control egress
  - Pressurized stairways
  - Smoke-control systems
  - Automatic closing fire doors

Discussion Questions

1. Is an exterior path of egress part of an exit system?
2. Is a door that is part of a listed assembly always required to be self closing?
3. When does the code allow an exit to terminate before reaching a public way?

Activities

(Instructor to develop)

1. Given a plan, determine occupancy classification, square footage, occupant load, number of exits required, exit separation, door hardware, signage, and illumination.

Evaluation: Formative Test, Summative Test

**Unit 6: Incidental Storage, Handling, and Use of Hazardous Materials, Flammable and Combustible Liquids, and Gases (CTS 3-12)**

Topic 1: Classification and Properties ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify physical and chemical properties of liquids, gases and solids; describe the physical and health hazards of liquids, gases and solids; and identify ways to determine chemical information including the use of a Materials Safety Data Sheet.

Enabling Learning Objectives (ELO):

1. Define solid, liquid and gas
2. Identify physical properties of liquids, gases and solids, including:

- Color
  - Smell
  - Freezing point
  - Boiling point
  - Melting point
  - Opacity
  - Viscosity
  - Density
  - Specific gravity
  - Vapor density
  - Vapor pressure
  - Water solubility
  - Flammable/explosive range
  - Flashpoint
  - Evaporation rate
3. Identify chemical properties of liquids, gases and solids, including:
    - Heat of combustion
    - Reactivity with water
    - pH scale
  4. Describe the physical hazards of:
    - Explosives and blasting agents
    - Flammable and combustible liquids
    - Flammable solids and gases
    - Organic peroxide materials
    - Oxidizer materials
    - Pyrophoric materials
    - Unstable (reactive) materials
    - Water reactive solids and liquids
    - Cryogenic fluids
    - Combustible fibers
  5. Describe the health hazards of:
    - Highly toxic materials
    - Toxic materials
    - Corrosive materials
  6. Identify ways to determine chemical information, including:
    - Material Safety Data Sheet
    - Labels
    - Shipping documents
    - References (ERG, NIOSH, etc.)
  7. Identify the common components of a Material Safety Data Sheet, including:
    - Chemical identity
    - Manufacturer information
    - Hazardous ingredients
    - Physical and chemical characteristics
    - Fire and explosion hazard data
    - Reactivity data
    - Health hazard data
    - Precautions for safe handling and use
    - Control measures

Discussion Questions



1. What chemical properties have a significant impact on code requirements?
2. How do you classify a chemical?
3. Where can you find the properties for a specific chemical?

Activities

(Instructor to develop)

1. Given several MSDS examples, ask students to classify products.

Evaluation: Formative Test, Summative Test

Topic 2: Applicable Codes, Standards and Requirements ..... 2:00

Terminal Learning Objective (TLO): At the end of this topic, the student will be able to identify applicable codes and standards that regulate hazardous materials, requirements for hazardous material incidental storage, and CUPA reporting requirements for an individual hazardous material, and be able to verify, document and resolve deficiencies.

Enabling Learning Objectives (ELO):

1. Identify applicable codes and standards that regulate hazardous materials, including:
  - California Fire Code
  - California Building Code
  - NFPA
2. Identify requirements to allow incidental storage of hazardous materials, including:
  - Maximum allowable quantities
    - CFC Table 2703.1.1 (1-4)
    - CFC Table 2703.11.1
  - Permissible quantities
  - Labeling
  - Storage
  - Handling and use
  - Waste
3. Identify the reporting requirements for a Certified Unified Program Agency (CUPA) for an individual hazardous material in excess of:
  - 55 gallons
  - 200 cubic feet
  - 500 pounds
4. Describe how to verify deficiencies, including:
  - Observation and documentation
  - Reporting in accordance with jurisdictional codes, standards, and policies
  - Referring to appropriate level when necessary

Discussion Questions

1. What is the difference between quantities requiring a permit and maximum allowable quantities?
2. What fire-code-regulated activities does the CUPA control?

Activities

(Instructor to develop)

1. Given various scenarios, determine if the quantity and type of chemical exceeds the maximum allowable quantity.

Evaluation: Formative Test, Summative Test

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### Activity 3-2: Construction Types

Match each building with its appropriate construction type.

#### Construction Type

- Type I (A and B)
- Type II (A and B)
- Type III (A and B)
- Type IV - Heavy Timber
- Type V (A and B)

Building	Construction Type
1. Single family residence	
2. Hospital	
3. Strip center	
4. Office building with heavy timbers	
5. Strip center with limited wood	
6. Office building with concrete tilt up	
7. Residence with lightweight steel	

### Activity 3-2: Construction Types

#### Answer Key

Dennis still needs to provide.

### Activity 5-1: Means of Egress Elements

Match each component with a means of egress element.

#### Means of Egress

- Exit Access
- Exit
- Exit Discharge

Component	Means of Egress
1. Exit passageway	_____
2. Horizontal exit	_____
3. Corridor	_____
4. Enclosed exit stair	_____
5. Egress court	_____
6. Room	_____
7. Exit balcony	_____
8. Aisle	_____
9. Exterior ramp	_____
10. Common path of egress travel	_____
11. Smoke-proof enclosure	_____
12. Exit door	_____

## Activity 5-1: Means of Egress Elements

### Answer Key

Bill still needs to provide.